Zero Impact Factory Twin:

Digital Twin meets Sustainability

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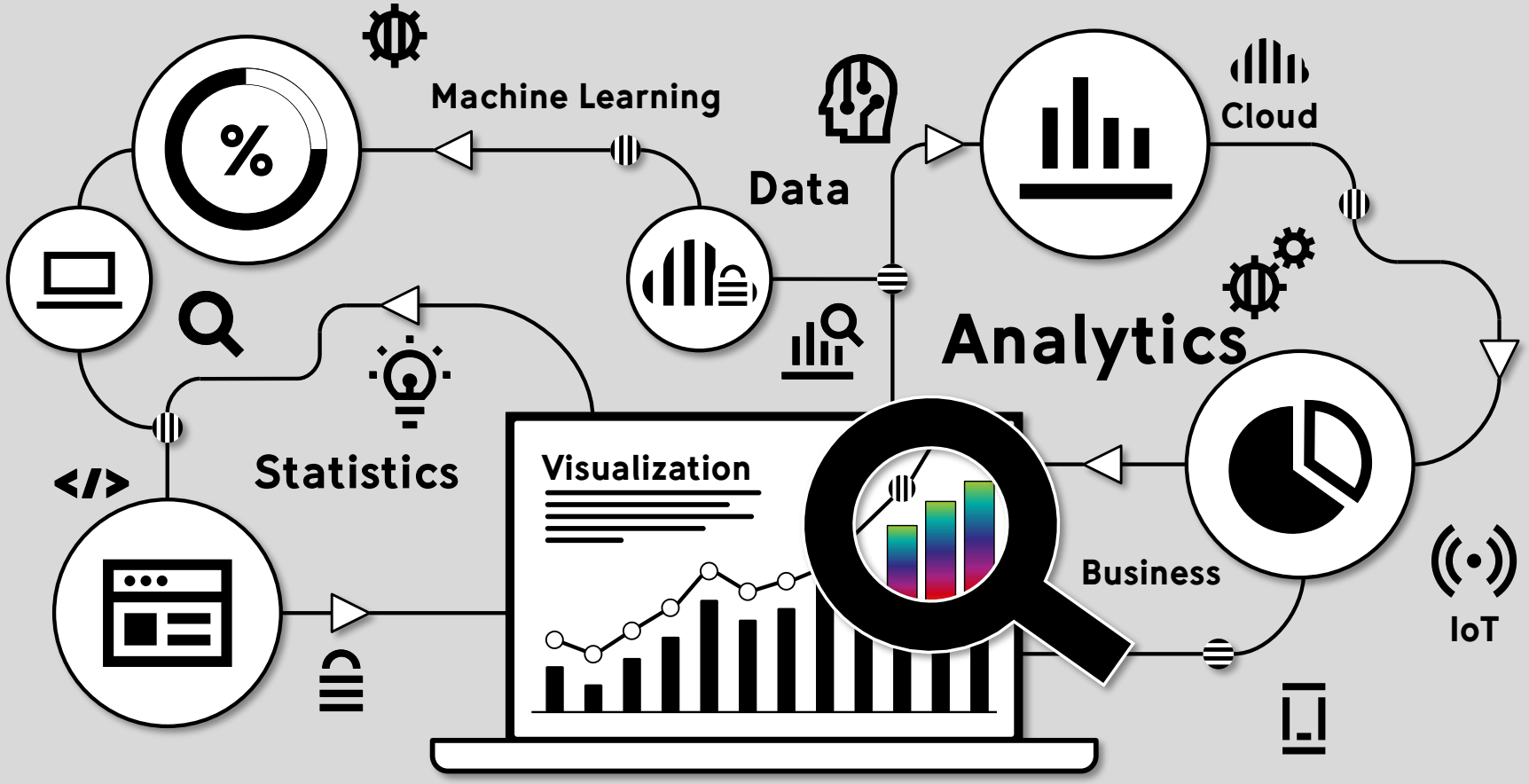
„With great power comes great responsibility"

Stan Lee

A Complex Orchestra
To create a compelling symphony.

Every aspect of the Digital Twin needs to be harmonized with the bigger picture to create a compelling symphonie.

- Conductor – Perfect interplay and synchronisation between data and processes
- Violine Solo – Zoom in to specific details
- Attendance of all musicians – Availability of the data
- Studying the composition – Data is coherent and trustworthy


Machine Learning
Data
Cloud
Analytics
Statistics
Visualization
Business
IoT

Digital Twin

The different levels of data readiness.

1 → 2 → 3 → 4 → 5

Level 1: Data
At this stage, data is collected at some points, but not sufficient to gain real information and value.

Level 2: Information
If enough data is collected efficiently, information can be gained through that. But the context might still be missing.

Level 3: Knowledge
Information gained through data in the right context can lead to highly valuable knowledge. But is that knowledge accessible?

Level 4: Action
Knowledge made accessible to the right people can lead to important decisions and actions.

Level 5: Prediction
If coherent data is collected over a certain period; this can enable extremely valuable predictions.

The Challenge.
Digital Twin meets Sustainability.

- More constraints from different stakeholders arise – foremost **customers, regulations and investors** – the manufacturing system has to find solution to reduce its impact to a minimum or even below zero.
- The dynamic interaction can only be analyzed by using **new digital solution** to reflect more **customization** and **complex production** technologies.
- There is a need to identify the **performance transparently** and as realistically as possible to reduce any unsustainable investment.
- The digital twin has to address **strategic planning**, **priority setting**, **product** or **process development** and be used as a **communication tool**.

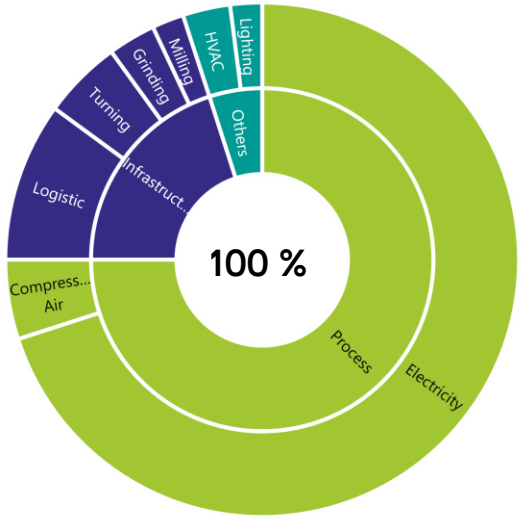
Zero Impact Factory Twin.*

Challenge turned into solution.

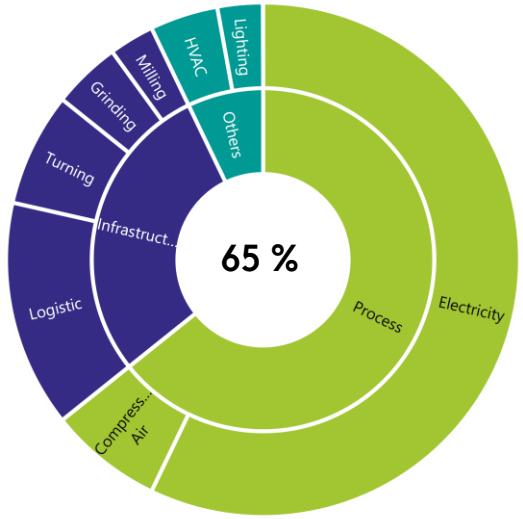
Making manufacturing **transparent** and strive for **effective** solutions. Finding optimization potentials in Management Systems, aligning to planetary boundaries, improve logistics, use ideal technology & processes, progressive production planning, holistic design of factory and no breakdowns. Optimized design with **digital capabilities** that enables to achieve **sustainability targets** and even beyond.

*The ZIFT by umlaut

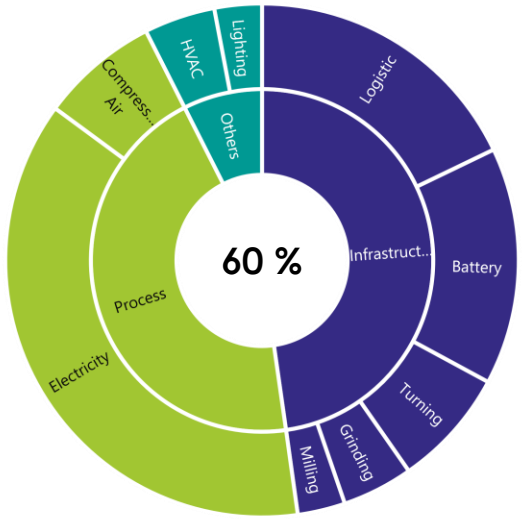
The ZIFT
Factory Performance Dashboard.



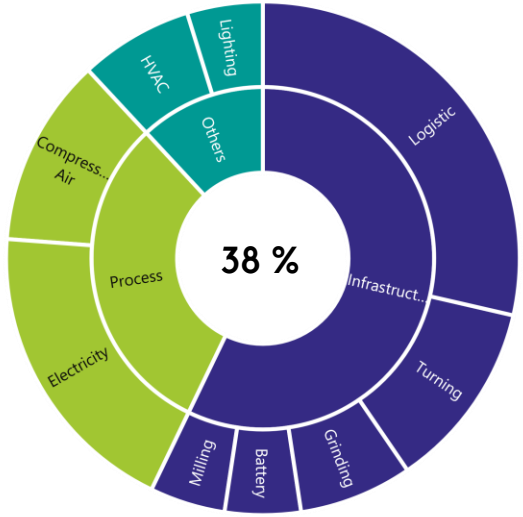
Baseline



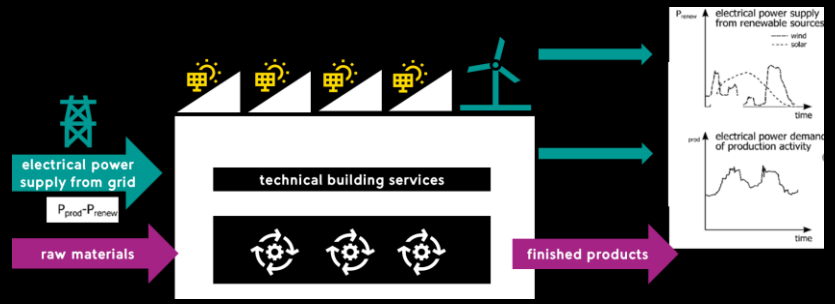
Same Output with direct RE



Max. direct RE & same Output



Minium Impact & less Output



Renewable energy leads to better environmental performance

The substitution of the grid mix with renewable energy on–site leads to significant reduction of Global Warming potential. The maximization of RE leads to a worse environmental performance.

Global Warming Potential is not the only factor.

Abiotic Depletion Potential is a very sensitive category, as it is worse than the scenario with the grid mix.

Infrastructure and HVAC plays a crucial role

Renewable Energy leads to additional infrastructure (Batteries, Wires, Computer etc.) thus additional emissions.

Outlook.
Next Steps.

Challenges / Externalities: Creating a coherent, transparent, and complete big picture of all steps and stages in the factory, the relevant data associated with and generated by them as well as all suppliers and service providers and their specs and data involved.

Chances / Opportunities: The industry gets a chance to work together to build a GDPR–compliant "open data" transparency platform as part of the ESG challenge. This will create synergies, make optimal and transparent use of information, build credibility and trust, and create added value for everyone.

Regulation / Controlling: Creating a state in which as few incentives and opportunities as possible remain to circumvent or undermine ESG regulations and laws. Further incentives must be created to voluntarily and economically implement a Zero Impact Factory Twin, for example.

Standards / Certificates: Common, accepted and transparent minimum standards, licensing and certification increase credibility, acceptance and dissemination within the business community and down to the end customer. Nevertheless, compliance with the standards must be strictly monitored, tracked and sanctioned.

Thanks for your attention.
Let’s get in touch.

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